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Indications of Rapid Expansion of the East German Semi-Conductor Industry

Recent information from a highly qualified and well-placed source indicates that East Germany may now be sufficiently advanced in the semi-conductor production art to be an important contributer to Soviet Bloc capabilities in the output of electronic components for specialized weapons. East Germany is thus far ahead of the other Satellite countries in this field. This improved capability appears to be based on techniques acquired from West Germany rather than the USSR, although there are indications that supplies of germanium are received from the USSR. Production types include germanium high-frequency and power transistor types for military applications, and development work is reportedly completed on a series of silicon transistor types. Silicon transistors, which can operate at higher temperatures than germanium transistors, are used primarily for military applications such as guided missiles where the greater temperature capabilities more than offset the higher cost of components. The initial transistor output is reportedly to be used in unspecified military end items, with one specific shipment of 1000 units to an East German Air Force establishment at Cottbus.

25X1C8b [redacted] gives details of East German development work and production plans for transistors. The main program is under the direction of the VEB Werk fuer Fernmeldewesen (Oberspreewerk), Berlin and

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in addition two RFT plants - VEB Funkwerk, Erfurt, and VEB Carl von Ossietzky, Berlin-Teltow, are engaged in transistor development. The development work is reported to have been completed and machinery is on hand for the production of a comprehensive line of germanium transistors, including audio, radio frequency, computer and power types. The germanium high frequency types are intended for use in military equipment and were to have gone into production in January, 1958. Development work has also been completed on a series of silicon transistors. In addition VEB Oberspreewerk has developed a series of silicon power rectifiers. The source comments that the transistors which the East Germans have developed resemble, or are strikingly similar to, those of the firm of Intermetal of Duesseldorf, West Germany. 1/

In addition, there have been a number of reports on a new East German semiconductor factory being built at Frankfurt/Oder under the supervision of personnel from VEB Carl von Ossietzky, Berlin-Teltow. This factory is to be in full production in the later part of 1958, with the first two units constructed including a shop for crystal growing and a shop for large scale transistor production. Eventually it is planned to have five large shops with total employment of 4000. 2/ 3/ 4/ 5/

In October, 1957, VEB Carl von Ossietzky reportedly received its first shipment of germanium from the USSR. Tests indicated further purification was necessary and this work was done by the VEB Elektrochemisches Kombinat, Bitterfeld. The shipment weighed 25 kilograms. 6/

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These reports show sharply increased East German activity in the semiconductor field and place the East German industry far ahead of the other Satellites. The types developed cover a wide range of products, but do not include types operating in the VHF range or power transistors with dissipation ratings over 15 watts. The reported use of the high frequency types for military equipment indicates the production of a class of military end items which has not been previously reported. The transistors are in marked contrast with the previous Satellite products, which have been predominantly audio frequency transistors. 7/

An extremely important part of the report is the inclusion of silicon transistors on the list of items on which development has been completed. This is the first report of the development to a production stage of silicon transistors by any country of the Soviet Bloc. As commentary on this, a U.S. semiconductor expert who travelled in the Soviet Union in late 1957 and visited a number of research institutions reported a good deal of work on germanium but saw no evidence of work on silicon. 8/ Silicon transistors, which can operate at higher temperatures than germanium transistors, are used primary for military applications such as guided missiles where the greater temperature capabilities more than offset the higher cost.

The similarity of the types and specifications to those of the West German firm strongly suggests the increased East German activity in the semi-conductor field is based on West German technology. Transistor technology is a commodity

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that is extremely valuable and very easy to export. Thus it appears that the East Germans have, through the acquisition of West German production techniques and development work, significantly increased their capabilities in the field and are going into volume production earlier than had been expected.

The acquisition of germanium from the U.S.S.R. in a quantity which indicates production activity rather than research suggests that the germanium production capabilities of the Soviet Union are now adequate for their own use and are also sufficient to permit exports to Bloc countries for production. A recent visitor to the Soviet Union reported there was no shortage of germanium, which is obtained from zinc smelting and coal dust as is done in the U.S. The same visitor reported that excellent crystal growing furnaces for the purification of the germanium had also been developed in the U.S.S.R. 9/ Since the first shop being built at the new East German factory is for crystal growing, it is reasonable to assume that this aspect of production has been mastered. The problem of the purification of silicon to transistor grade purity on a production basis will be more difficult, and here any knowledge acquired from West Germany will be extremely valuable. The West Germans are now producing the world's purest silicon and although the firm doing this is not Intermetal, the overall work in silicon being done by the West Germans is among the best in the world. 10/

Sources 25X1A2g

1. CIA. [redacted] Transistor Development in East Germany. 7 Apr 58. S/NOFORN.

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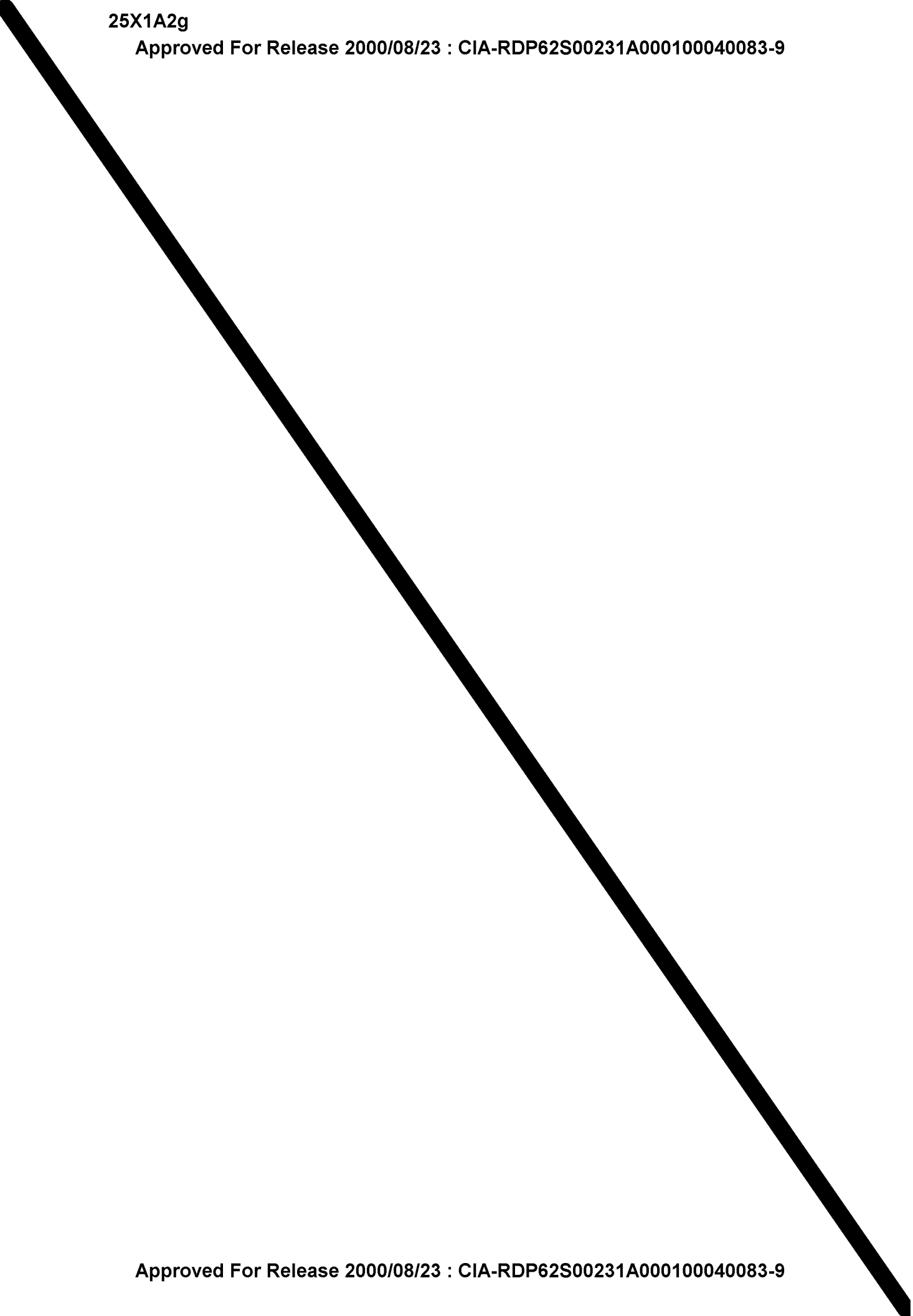

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